

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) An apparatus for identifying a liquid type of a gasoline, comprising:
a gasoline liquid type identifying chamber for causing an identified gasoline introduced into a liquid type identifying apparatus body to stay temporarily;
a liquid type identifying sensor heater provided in the gasoline liquid type identifying chamber; and
a liquid temperature sensor provided in the gasoline liquid type identifying chamber apart from the liquid type identifying sensor heater at a constant interval;
the liquid type identifying sensor heater including a heater and an identifying liquid temperature sensor provided in the vicinity of the heater, and
the apparatus further comprising an identification control portion;
the identification control portion being constructed that a pulse voltage is applied to the liquid type identifying sensor heater for a predetermined time, and the identified gasoline staying temporarily in the gasoline liquid type identifying chamber is heated by the heater and the liquid type is identified with a voltage output difference V_0 corresponding to a temperature difference between an initial temperature and a peak temperature in the identifying liquid temperature sensor.

2. (Original) The apparatus for identifying a liquid type of a gasoline according to claim 1, wherein the voltage output difference V_0 is equal to a voltage difference between an average initial voltage V_1 obtained by sampling an initial voltage before application of the pulse voltage at a predetermined number of times and an average peak voltage V_2 obtained by sampling a peak voltage after the application of the pulse voltage at a predetermined number of times, that is,

$$V_0 = V_2 - V_1.$$

3. (Currently Amended) The apparatus for identifying a liquid type of a gasoline according to claim 1-~~or~~2, wherein the identification control portion identifies a type of a gasoline with the voltage output difference V_0 obtained for the identified gasoline, which is

based on calibration curve data to be a correlation of a voltage output difference with a temperature for a predetermined reference gasoline prestored in the identification control portion.

4. (Currently Amended) The apparatus for identifying a liquid type of a gasoline according to ~~any of claims 1 to 3~~claim 1, wherein the identification control portion correlates a liquid type voltage output V_{out} for the voltage output difference V_0 at a measuring temperature of the identified gasoline with an output voltage for a voltage output difference at a measuring temperature for a predetermined threshold reference gasoline and thus carries out a correction.

5. (Currently Amended) The apparatus for identifying a liquid type of a gasoline according to ~~any of claims 1 to 3~~claim 1, wherein the liquid type identifying sensor heater is a laminated liquid type identifying sensor heater in which a heater and an identifying liquid temperature sensor are laminated through an insulating layer.

6. (Currently Amended) The apparatus for identifying a liquid type of a gasoline according to ~~any of claims 1 to 5~~claim 1, wherein the heater and the identifying liquid temperature sensor in the liquid type identifying sensor heater are constituted to come in contact with the identified gasoline through a metallic fin, respectively.

7. (Currently Amended) The apparatus for identifying a liquid type of a gasoline according to ~~any of claims 1 to 6~~claim 1, wherein the liquid temperature sensor is constituted to come in contact with the identified gasoline through the metallic fin.

8. (Original) A method for identifying a liquid type of a gasoline, comprising the steps of:

applying a pulse voltage for a predetermined time to a liquid type identifying sensor heater including a heater and an identifying liquid temperature sensor provided in the vicinity of the heater;

heating an identified gasoline by the heater; and

identifying the liquid type with a voltage output difference V0 corresponding to a temperature difference between an initial temperature and a peak temperature in the identifying liquid temperature sensor.

9. (Original) The method for identifying a liquid type of a gasoline according to claim 8, wherein the voltage output difference V0 is equal to a voltage difference between an average initial voltage V1 obtained by sampling an initial voltage before application of the pulse voltage at a predetermined number of times and an average peak voltage V2 obtained by sampling a peak voltage after the application of the pulse voltage at a predetermined number of times, that is,

$$V0 = V2 - V1.$$

10. (Currently Amended) The method for identifying a liquid type of a gasoline according to claim 8-~~or 9~~, wherein a type of a gasoline is identified with the voltage output difference V0 obtained for the identified gasoline, based on calibration curve data to be a correlation of a voltage output difference with a temperature for a predetermined reference gasoline which is prestored.

11. (Currently Amended) The method for identifying a liquid type of a gasoline according to ~~any of claims 8 to 10~~ claim 8, wherein a liquid type voltage output Vout for the voltage output difference V0 at a measuring temperature of the identified gasoline is correlated with an output voltage for a voltage output difference at a measuring temperature for a predetermined threshold reference gasoline and is thus corrected.

12. (Currently Amended) The method for identifying a liquid type of a gasoline according to ~~any of claims 8 to 11~~ claim 8, wherein the liquid type identifying sensor heater is a laminated liquid type identifying sensor heater in which a heater and an identifying liquid temperature sensor are laminated through an insulating layer.

13. (Currently Amended) The method for identifying a liquid type of a gasoline according to ~~any of claims 8 to 12~~ claim 8, wherein the heater and the identifying liquid

temperature sensor in the liquid type identifying sensor heater are constituted to come in contact with the identified gasoline through a metallic fin, respectively.

14. (Currently Amended) The method for identifying a liquid type of a gasoline according to ~~any of claims 8 to 13~~claim 8, wherein the liquid temperature sensor is constituted to come in contact with the identified gasoline through the metallic fin.

15. (Currently Amended) An apparatus for identifying a liquid type of a gasoline of a car, comprising:

the apparatus for identifying a liquid type of a gasoline according to ~~any of claims 1 to 7~~claim 1 which is provided in one of a gasoline tank, or on an upstream side or a downstream side of a gasoline pump.

16. (Currently Amended) A method for identifying a liquid type of a gasoline of a car, comprising the step of:

identifying a type of a gasoline in a gasoline tank or on an upstream side or a downstream side of a gasoline pump by using the method for identifying a liquid type of a gasoline according to ~~any of claims 8 to 14~~claim 8.

17. (Currently Amended) An apparatus for reducing an exhaust gas of a car, comprising:

the apparatus for identifying a liquid type of a gasoline according to ~~any of claims 1 to 7~~claim 1 which is provided in a gasoline tank or on an upstream side or a downstream side of a gasoline pump; and

an ignition timing control device for regulating an ignition timing based on a type of the gasoline which is identified by the apparatus for identifying a liquid type of a gasoline.

18. (Currently Amended) A method for reducing an exhaust gas of a car, comprising the steps of:

identifying a type of a gasoline in a gasoline tank or on an upstream side or a downstream side of a gasoline pump by using the method for identifying a liquid type of a gasoline according to ~~any of claims 8 to 14~~claim 8, and

regulating an ignition timing based on the type of the gasoline which is identified by the apparatus for identifying a liquid type of a gasoline.

19. (Currently Amended) An apparatus for reducing an exhaust gas of a car, comprising:

the apparatus for identifying a liquid type of a gasoline according to ~~any of claims 1 to 7~~claim 1 which is provided in a gasoline tank or on an upstream side or a downstream side of a gasoline pump; and

a gasoline compression control device for regulating a compressibility of the gasoline based on a type of the gasoline which is identified by the apparatus for identifying a liquid type of a gasoline.

20. (Currently Amended) A method for reducing an exhaust gas of a car, comprising the steps of:

identifying a type of a gasoline in a gasoline tank or on an upstream side or a downstream side of a gasoline pump by using the method for identifying a liquid type of a gasoline according to ~~any of claims 8 to 14~~claim 8, and regulating a compressibility of the gasoline based on the type of the gasoline which is identified by the apparatus for identifying a liquid type of a gasoline.

21. (New) The apparatus for identifying a liquid type of a gasoline according to claim 2, wherein the identification control portion identifies a type of a gasoline with the voltage output difference V_0 obtained for the identified gasoline, which is

22. (New) The apparatus for identifying a liquid type of a gasoline according to claim 2, wherein the identification control portion correlates a liquid type voltage output V_{out} for the voltage output difference V_0 at a measuring temperature of the identified gasoline with

an output voltage for a voltage output difference at a measuring temperature for a predetermined threshold reference gasoline and thus carries out a correction.

23. (New) The apparatus for identifying a liquid type of a gasoline according to claim 3, wherein the identification control portion correlates a liquid type voltage output V_{out} for the voltage output difference V_0 at a measuring temperature of the identified gasoline with an output voltage for a voltage output difference at a measuring temperature for a predetermined threshold reference gasoline and thus carries out a correction.

24. (New) The method for identifying a liquid type of a gasoline according to claim 9, wherein a type of a gasoline is identified with the voltage output difference V_0 obtained for the identified gasoline, based on calibration curve data to be a correlation of a voltage output difference with a temperature for a predetermined reference gasoline which is prestored.

25. (New) The method for identifying a liquid type of a gasoline according to claim 9, wherein a liquid type voltage output V_{out} for the voltage output difference V_0 at a measuring temperature of the identified gasoline is correlated with an output voltage for a voltage output difference at a measuring temperature for a predetermined threshold reference gasoline and is thus corrected.

26. (New) The method for identifying a liquid type of a gasoline according to claim 10, wherein a liquid type voltage output V_{out} for the voltage output difference V_0 at a measuring temperature of the identified gasoline is correlated with an output voltage for a voltage output difference at a measuring temperature for a predetermined threshold reference gasoline and is thus corrected.

27. (New) An apparatus for identifying a liquid type of a gasoline of a car, comprising:

the apparatus for identifying a liquid type of a gasoline according to claim 2 which is provided in one of a gasoline tank, or on an upstream side or a downstream side of a gasoline pump.

28. (New) An apparatus for identifying a liquid type of a gasoline of a car, comprising:

the apparatus for identifying a liquid type of a gasoline according to claim 3 which is provided in one of a gasoline tank, or on an upstream side or a downstream side of a gasoline pump.

29. (New) An apparatus for identifying a liquid type of a gasoline of a car, comprising:

the apparatus for identifying a liquid type of a gasoline according to claim 4 which is provided in one of a gasoline tank, or on an upstream side or a downstream side of a gasoline pump.

30. (New) A method for identifying a liquid type of a gasoline of a car, comprising the step of:

identifying a type of a gasoline in a gasoline tank or on an upstream side or a downstream side of a gasoline pump by using the method for identifying a liquid type of a gasoline according to claim 9.

31. (New) A method for identifying a liquid type of a gasoline of a car, comprising the step of:

identifying a type of a gasoline in a gasoline tank or on an upstream side or a downstream side of a gasoline pump by using the method for identifying a liquid type of a gasoline according to claim 10.

32. (New) A method for identifying a liquid type of a gasoline of a car, comprising the step of:

identifying a type of a gasoline in a gasoline tank or on an upstream side or a downstream side of a gasoline pump by using the method for identifying a liquid type of a gasoline according to claim 11.

33. (New) An apparatus for reducing an exhaust gas of a car, comprising:
the apparatus for identifying a liquid type of a gasoline according to claim 2 which is provided in a gasoline tank or on an upstream side or a downstream side of a gasoline pump;
and

an ignition timing control device for regulating an ignition timing based on a type of the gasoline which is identified by the apparatus for identifying a liquid type of a gasoline.

34. (New) An apparatus for reducing an exhaust gas of a car, comprising:
the apparatus for identifying a liquid type of a gasoline according to claim 3 which is provided in a gasoline tank or on an upstream side or a downstream side of a gasoline pump;
and

an ignition timing control device for regulating an ignition timing based on a type of the gasoline which is identified by the apparatus for identifying a liquid type of a gasoline.

35. (New) An apparatus for reducing an exhaust gas of a car, comprising:
the apparatus for identifying a liquid type of a gasoline according to claim 4 which is provided in a gasoline tank or on an upstream side or a downstream side of a gasoline pump;
and

an ignition timing control device for regulating an ignition timing based on a type of the gasoline which is identified by the apparatus for identifying a liquid type of a gasoline.